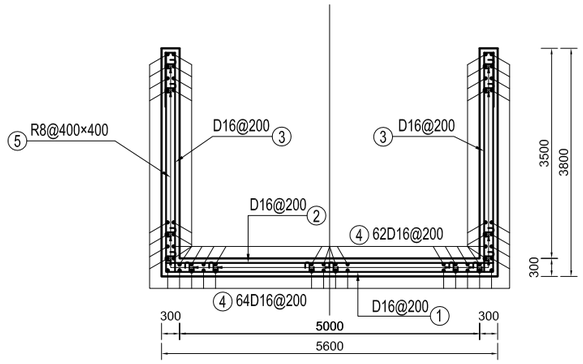
TYPICAL CROSS SECTION D1
(for rock class I&II)

SCALE 1:50



REBAR LIST OF LINING A PER METER

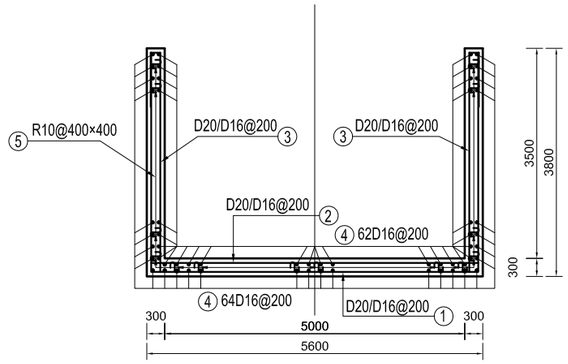
NO	SHAPE (mm)	DIAMETER (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (m)	REMARKS
①	3650 5450 3650	D16	12750	5	63.75	
②	420 5450 420	D16	6290	5	31.45	
③	420 3650 150 800	D16	5020	10	50.20	
④	1000	D16	1000	126	126.00	
⑤	130 150 130	R8	410	78	31.98	

BOQ OF LINING TYPE D1(PER METER)

LINING TYPE	Diameter (mm)	Total length (m)	Unit weight (kg/m)	Total weight (kg)	Summation (kg)
D1	D16	271.40	1.580	428.81	441.44
	R8	31.98	0.395	12.63	
	Concrete: 3.78 m³				

TYPICAL CROSS SECTION D2
(for rock class III)

SCALE 1:50



REBAR LIST OF LINING A PER METER

NO	SHAPE (mm)	DIAMETER (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (m)	REMARKS
①	3650 5450 3650	D20	12750	3	38.25	
	3650 5450 3650	D16	12750	2	25.50	
②	575 5450 575	D20	6600	3	19.80	
	415 5450 415	D16	6280	2	12.56	
③	575 3650 150 1000	D20	5375	12	64.50	
	415 3650 150 800	D16	5015	8	40.12	
④	1000	D16	1000	126	126.00	
⑤	130 150 130	R10	410	78	31.98	

BOQ OF LINING TYPES D2(PER METER)

LINING TYPE	Diameter (mm)	Total length (m)	Unit weight (kg/m)	Total weight (kg)	Summation (kg)
D2	D20	122.55	2.470	302.70	645.03
	D16	204.18	1.580	322.60	
	R10	31.98	0.617	19.73	
	Concrete: 3.78 m³				

SCALE:

1:50 0 1 2 3 4 5 (m)

NOTE

1. The set of drawings is reinforcement for lining of diversion tunnel.
2. Elevations,chainages are measured in meter,diameter and spacing of rebar are millimeter, dimensions are in millimeter unless otherwise stated.
3. The thickness of concrete cover is 7.5cm.
4. Concrete faces of construction joints shall be roughed appropriately.
5. Symbol description:
   R denotes round bar, yield strength of the round bar is 280MPa;
   D denotes deformed bar, yield strength of the deformed bar is 500MPa.
7. Anchorage length of rebar shall be not less than 40 times of the reinforcement diameter, and lap length of rebar is 50 times of the reinforcement diameter.

REFERENCE DRAWINGS

UT1-C-010-CVL-DG-42001	Arrangement drawing of diversion tunnel
UT1-C-010-CVL-DG-42003	Outline drawing of inlet structure of diversion tunnel
UT1-C-010-CVL-DG-42005	Outline drawing of diversion tunnel lining

SYMBOL AND LEGEND

FOR APPROVAL

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE PRELIMINARY FOR APPROVAL.
IT CAN BE CHANGED IN THE EXECUTION STAGE
THIS DRAWING IS THE PROPERTY OF DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
IT IS NOT TO BE COPIED OR USED IN ANY WAY DETRIMENTAL TO THE COMPANY.

REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.
0A	18.Mar.2022	FIRST ISSUE	Zhu T.Z.	Lei Y.G.	Han J.B. Luo L.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER

NWEDC

OWNER'S ENGINEER

TRACTEBEL ENGIE jade CONSULT

CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE

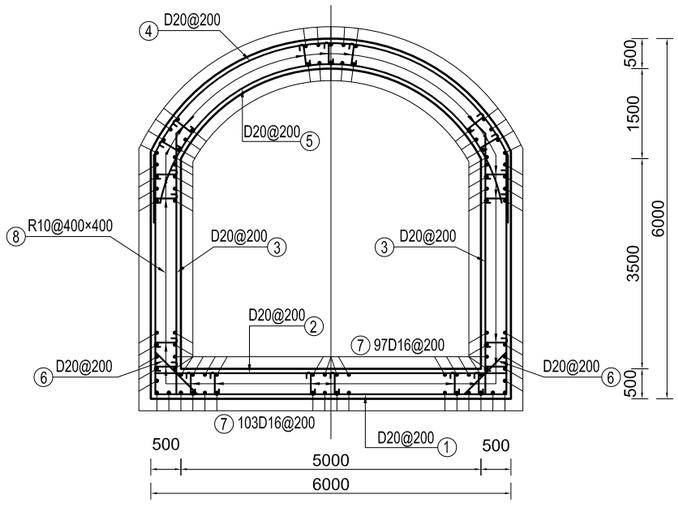
REINFORCEMENT DRAWING OF DIVERSION TUNNEL LINING

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-010-CVL-DG-42006-1	1 OF 2	0A

A1 (594 x 841 MM)

TYPICAL CROSS SECTION D3
(for rock class IV)

SCALE 1:50



REBAR LIST OF LINING A PER METER

NO	SHAPE (mm)	DIAMETER (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (m)	REMARKS
①	400 5850 400	D20	13910	5	69.55	
②	380 5850 380	D20	6610	5	33.05	
③	380 4340 θ=145° 400	D20	5120	10	51.20	
④	7260 1000 θ=127.71° R=325.83 1000	D20	9260	5	46.30	
⑤	6320 800 θ=124.60° R=290.83 800	D20	7920	5	39.60	
⑥	990	D20	990	10	9.90	
⑦	1000	D16	1000	200	200.00	
⑧	130 350 130	R10	610	120	73.20	

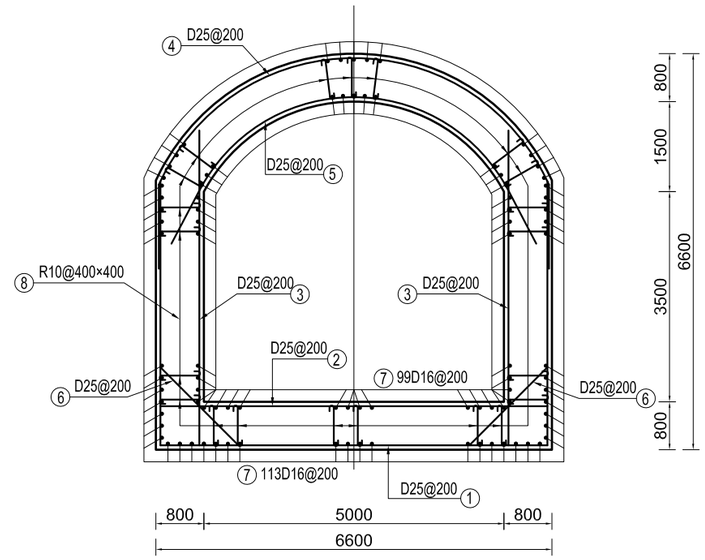
BOQ OF LINING TYPE D3(PER METER)

LINING TYPE	Diameter (mm)	Total length (m)	Unit weight (kg/m)	Total weight (kg)	Summation (kg)
D3	D20	249.60	2.470	616.51	977.67
	D16	200.00	1.580	316.00	
	R10	73.20	0.617	45.16	
	Concrete: 9.96 m³				

TYPICAL CROSS SECTION D4
(for intersection of headrace and diversion tunnel)

CHAINAGE D0+158.607-D0+178.607

SCALE 1:50



REBAR LIST OF LINING A PER METER

NO	SHAPE (mm)	DIAMETER (mm)	LENGTH (mm)	NUMBER	TOTAL LENGTH (m)	REMARKS
①	4400 6450 4400	D25	15250	5	76.25	
②	280 6450 280	D25	7010	5	35.05	
③	280 5240	D25	5520	10	55.20	
④	8070 1250 θ=130.00° R=355.83 1250	D25	10570	5	52.85	
⑤	6320 1000 θ=124.60° R=290.83 1000	D25	8320	5	41.60	
⑥	1840	D25	1840	10	18.40	
⑦	1000	D16	1000	212	212.00	
⑧	130 650 130	R10	910	120	109.20	

BOQ OF LINING TYPE D4(PER METER)

LINING TYPE	Diameter (mm)	Total length (m)	Unit weight (kg/m)	Total weight (kg)	Summation (kg)
D4	D25	279.35	3.850	1075.50	1477.84
	D16	212.00	1.580	334.96	
	R10	109.20	0.617	67.38	
	Concrete: 16.79 m³				

SCALE:

1:50 0 1 2 3 4 5 (m)

NOTE

1. The set of drawings is reinforcement for lining of diversion tunnel.
2. Elevations,chainages are measured in meter,diameter and spacing of rebar are millimeter, dimensions are in millimeter unless otherwise stated.
3. Other notes please refer to the 1/2.

REFERENCE DRAWINGS

UT1-C-010-CVL-DG-42001	Arrangement drawing of diversion tunnel
UT1-C-010-CVL-DG-42003	Outline drawing of inlet structure of diversion tunnel
UT1-C-010-CVL-DG-42005	Outline drawing of diversion tunnel lining

SYMBOL AND LEGEND

FOR APPROVAL

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE PRELIMINARY FOR APPROVAL.
IT CAN BE CHANGED IN THE EXECUTION STAGE
THIS DRAWING IS THE PROPERTY OF DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
IT IS NOT TO BE COPIED OR USED IN ANY WAY DETRIMENTAL TO THE COMPANY.

REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.
0A	18.Mar.2022	FIRST ISSUE	Zhu T.Z.	Lei Y.G.	Han J.B. Luo L.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER

NWEDC NEPAL WATER AND ENERGY DEVELOPMENT CO. PVT. LTD.

OWNER'S ENGINEER

TRACTEBEL ENGIE jade CONSULT

CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE

REINFORCEMENT DRAWING OF DIVERSION TUNNEL LINING

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-010-CVL-DG-42006-2	2 OF 2	0A

A1 (594 x 841 MM)